Design and Implement of Pets Management System using Mobile Phone

Sam-Jin Jeong

Abstract: ***Products for companion animal management system using smart phone are rapidly expanding as the pet animal industry grows globally. In this paper, we tried to broaden the application by integrating various contents about companion animals.***

We aim to apply various contents related to companion animals such as information management, schedule, health care, QR code, SNS, shopping, and location information service to the application. As a result of this research, we found that the new synergy effect was achieved through the integration between the contents, and the application field of the contents was widened due to the increased connectivity.

In this study, we have developed a synergy effect through the integration of various contents by adding various contents related to companion animals and studied the necessary parts to expand the application field by increasing the interaction and connection between functions. Improvements and differentiations include comprehensive content management and comprehensive information management and sharing through QR CODE SYSTEM. As a result of the production and execution of this PET-IN, the interactions between the respective contents smoothly complemented the disadvantages and the advantage was maximized. In addition, by creating synergy effect of new effects, various functions can be applied more than other applications, and it is wider and more efficient in function. The user's feedback is reflected, and more content is added to further expand the function and efficient linkage can lead to the user's use of the application and the high effect of the function linkage can lead to the satisfaction of the user.

This implies that comprehensive content composition is required for companion applications and may be important data for composing contents of companion animal applications in the future.

Keywords : Pets Management System, QR Code, Companion Animal Application, Mobile Application

I. INTRODUCTION

Products for companion animal management system using smart phone are rapidly expanding as the pet animal industry grows globally. As the nuclear family and aging with the low birth rate, the psychological factors that the companion animal wants to be comforted and the awareness of companion animals as children are becoming stronger. However, there is a low level of national animal protection policy to protect the safety of animals. For companion animals, it attempts to analyze the acceptance factors and influencing factors of smart technology introduction for the companion animal [1], [2]. According to the National Agricultural Cooperative Federation's Economic Research Institute in September 2014, Korea's pet animal market is experiencing a high growth rate of more than two digits each year despite the recession. The market size is estimated to be 1.14 trillion won in 2013, 1.8 trillion won in 2014, And it is expected to reach 6 trillion won in 2011 [3]. According to the survey of Agriculture, Forestry and Fisheries Quarantine Inspection Headquarters, the proportion of households that keep pets in 2012 is 20%, of which about 10 million people live with pets [4]. The number of companion animals grows year by year, the number of companion animals grows sharply, compared with the number of mobile applications associated with them, as well as their simplicity in terms of functionality [5], [6]. In this study, the application function and the state survey were improved to improve the points that were insufficient. That is, it is possible to integrate more functions than the existing application with Dean function, and to increase the connection, PET-IN, an application that can be maximized.

II. SURVEY OF DOMESTIC COMPANION ANIMAL MANAGEMENT APPLICATIONS

A. Survey of Domestic Companion Animal Management Functions

Most companion animal applications using smart phones were limited to basic information management functions and received little attention from users [7], [8]. This means that while other parts of the application are active, applications on companion animals are not. We saw the problem as a simple function.

Table 1 summarizes the functions of domestic pet care applications to investigate how synergistic effects of various functions integrate than a single basic function. Company A's application only provides location information, vaccination, and information management functions, so fewer users are less likely to use the applications. Company B's applications provide fewer users despite providing appropriate functions for social commerce, shopping, location information, and healthcare. The reason for this is that the number of application users is reduced because there is no SNS function and the information about pets is not shared. C's applications have location information, health care, and social networking functions, but they do not have

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social commerce and shopping functions, which makes users inconvenient to purchase supplies through other methods and media. This leads to a decrease in the number of users.

D's application was not needed for those who do not grow companion animals because of the small amount of information management, immunization and schedule management. This lowers the number of users who use the application. E's applications have all the basic functions required by users with functions such as social commerce, shopping, health care, information management, and immunization, but the number of users has decreased because of convenience such as location information function and lack of real-time communication function of SNS function.

Table- I: Evaluation table for 5 companies' companion animal management applications

Table	Evaluation	A	B	C	D	E
Basic Functions	Health Management	X	O	O	X	O
	Information Management	O	O	O	O	O
	Schedule Management	O	O	O	O	O
	vaccination	O	O	O	O	O
Extra Functions	QR	X	X	X	X	X
	Social Commerce	X	O	X	X	O
	Shopping	X	O	X	X	O
	Location Information	O	O	O	X	X
	SNS	X	X	O	X	X

(Support: O, Non-Support: X)

B. Survey on use of companion applications

In this section, it shows the actual use of companion applications. This survey was conducted through a questionnaire survey. We surveyed 100 students and 50 students who did not bring up companion animals to college students who use smart phones. We conducted a questionnaire survey on the sampling method of judgment samples during non - probability sampling. There are the users of companion animals among 100 students raising a pet. Only 15 out of 100 people were using the related application, and 85 people were unused.

There are students who are the current state of satisfaction, have pets and use related applications. Of the 15 students using related applications, 13 were found to be dissatisfied, while two were found to be satisfied.As a result, majority of students who use the relevant application are not satisfied with the application. It shows the results of 85 students who did not use related applications and 13 students who were not satisfied with the related applications among the students who raised pet animals.

This shows that the main reason for not using companion animal applications is the lack of contents and functions of applications. This shows that the biggest drawback is the addition of the content and functionality of the application.

III. IMPLEMENTATION OF PET MANAGEMENT (PET-IN)

A. Implementation of QR CODE SYSTEM

The above analysis, unused and dissatisfied, was supplemented by a survey of companion animal applications. It is necessary to supplement the simple functions of the application and to use the application by adding various contents. Through this integration, the use of the application was enhanced, and the synergy effect was created.

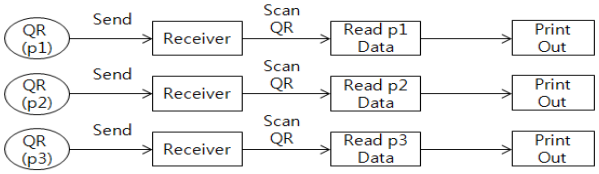
- Contents and Functions Add-on

Recently, the trend of application is not only a fragmentary function but also a complex function by adding various functions and contents. In the case of K, which is the No. 1 messenger application in Korea, it can be seen that the function of the initial messenger extends functions of shopping, SNS, social commerce, game, finance, and news [9], [10]. Thus, applications for companion animals can also increase the utilization rate of applications through synergy by integrating multiple functions rather than a fragmentary function. In addition to the ability to manage the basic information of the companion animal, we can give the user a synergy by integrating various functions such as QR CODE SYSTEM, social commerce shopping, location information, health information, SNS [11]. In addition, we have been developing to make various functions more convenient to use. As a result, PET-IN has been able to solve all the issues related to companion animals as an application and to increase the synergy effect.

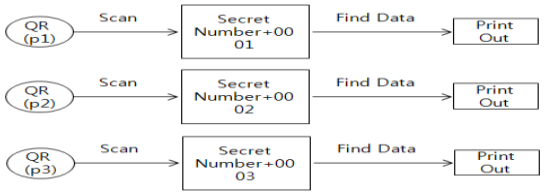
- QR CODE SYSTEM Add-on

QR CODE SYSTEM is a function developed to maximize convenience for users. Figure 1(a) and (b) show an algorithm for generating and providing QR CODE. Member information is stored in the DB when the user joins the membership. Add the subscription order to the encrypted cipher text that has been encrypted, convert it into QR CODE, and provide it to each individual. Through this, the information that the user saves in the application can be displayed through the QR CODE SCAN.

At this time, Figure 1(a) shows how the information screen is output when the QR CODE is SCANed by the QR CODE SCAN algorithm. Through this function, we have made it possible to share information about the companion animals among users with one QR CODE. Furthermore, by scanning the QR CODE in the veterinary hospital, accurate diagnosis of user companion animals was made possible. Figure 1(b) shows the SEND QR algorithm, which enabled the telemedicine of companion animals through this function.



(a)



(b)

Fig. 1. (a). QR CODE SCAN algorithm, (b). SEND QR algorithm

▪ Diagram of QR CODE SYSTEM

Figure 2 is a diagram of the QR CODE SYSTEM. There are two tables in the database of QR CODE: information management and health management. The information management table reads tables and fields corresponding to different companions for each of the table, 2,3 for large number of companion animals. Health care tables are divided into health care and immunization and read the field information in each record.

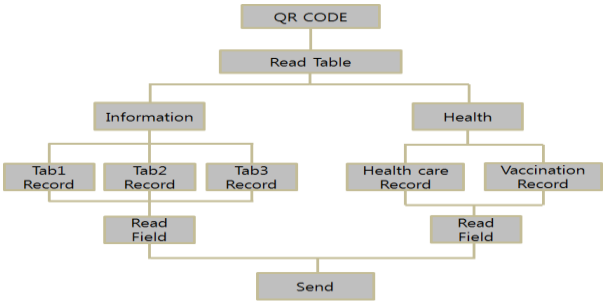


Fig. 2. QR CODE SYSTEM configuration

B. Implementation of Pet Management (PET-IN) using Mobile

By investigating the reasons for not using the implementation and dissatisfaction, it is possible to feel the necessity of using the application by supplementing the simple functions of the application and adding various contents. By adding various contents and functions to the application, we made PET-IN, an application that can enhance the use of applications and create synergy by integrating each function.

Figure 3 shows the main screen. You can move to each function screen through the main screen. It is possible to confirm simple limit information such as photograph, name, weight, breed, and height of current companion animal by linking with information management DB. Information management features include detailed information such as animal photos, QR CODE, name, owner ID, birthday, sex, height, breed, supplies, medication, and height and weight change graphs. Use items can be used in connection with shopping, SNS, health care, and medical records. You can check the items you use on shopping, share them on the SNS, find the cause of your health condition in your supplies [12]. The schedule screen can be used more conveniently in connection with vaccination, insect repellent medication, shopping, and a medical consultation log. You can enter health information of the companion animal by the health screen. Based on the health information you entered, you can get recommendations on shopping, get recommendations from social commerce, communicate with SNS, synchronize with QR code, and receive more convenient pet care.

Fig. 3. Main screen

The vaccination screen will tell you when the vaccinated animals are vaccinated and indicates the need for vaccination. The insect repellent screen informs you of the anticoagulant medication time and informs you of medication. The screen of two functions can be synchronized to the QR CODE and used conveniently at the hospital.

Fig. 4. QR CODE screen

Figure 4 shows QR CODE screen.

You can synchronize all basic information about the companion animal, health information, vaccinations, insect repellents, and places of visit by the QR CODE screen. By scanning the QR CODE, you can see the information that was synchronized. Based on this, it is possible to perform safe telemedicine and health screening, and it is possible to easily share information between users. The shopping screen recommends products suitable for companion animals based on the information of the companion animal and the health information. You can share your opinions about products through SNS and recommend products among users

The location information screen saves the place visited by the companion animal and allows you to leave a date and a brief note. It is useful when you want to view and get information later. You can share information with the place through SNS. When you receive telemedicine, you can get help from the place.

Through the SNS function by the SNS screen, it is possible to share the information of the companion animal in the application, health information, shopping information, place, and the like. In addition, communication among users is possible and all information can be shared. In addition, QR CODE makes it easier to share information and health information

IV. EXPERIMENTS

By the second questionnaire, we investigate the accessibility and satisfaction of PET-IN, a newly created companion animal application. The questionnaire was conducted using a questionnaire survey. We surveyed 50 students who raised pet animals and 20 students who did not raise them. The non-random sample was used as a judgment sampling method during the extraction. We surveyed the use of the PET-IN application and the intention to use the application for the 50 non-companion students. As a result of the survey, the majority of 47 students answered that they would use the application. This is 94% of the total, even though it is a non-breeding student.

We also surveyed the use of the PET-IN application and the satisfaction of the application to 20 students who raised the companion animal. The results of the questionnaire showed that 95% of the students answered that they were satisfied and 5% of the students answered that they did not know. The first reason for satisfaction was that 12 students (60%) chose the reason that the content of the application was included. Second, 30% of the students selected the reason that the function of the win-win medical treatment is convenient because of the linkage of the functions using the QR CODE SYSTEM. The third, 5%, chose one reason for the effective information management and health care of companion animals. Fourth, a student of 5% chose the reason for the wealth of information on companion animals.

V. CONCLUSION

In this study, we have developed a synergy effect through the integration of various contents by adding various contents related to companion animals, and studied the necessary parts to expand the application field by increasing the interaction and connection between functions. Improvements and differentiations include comprehensive content management and comprehensive information management and sharing through QR CODE SYSTEM. As a result of the production and execution of this PET-IN, the interactions between the respective contents smoothly complemented the disadvantages and the advantage was maximized. In addition, by creating synergy effect of new effects, various functions can be applied more than other applications, and it is wider and more efficient in function. The user's feedback is reflected, and more content is added to further expand the function and efficient linkage can lead to the user's use of the application and the high effect of the function linkage can lead to the satisfaction of the user.

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